

NISTTech**PUMPING AND PROBING OPTICAL SPECTROSCOPIES IN TRANSMISSION ELECTRON MICROSCOPY PLATFORMS
(TEM/STEM/ETEM/ESTEM)**

Docket No. 14-017**Abstract**

<p>Environmental transmission electron microscopy (ETEM) is ideally suited to observe dynamic changes in gas-solid interactions. The information obtained from atomic-scale measurements is (a) limited to nanometer-scale areas of the sample; (b) the data collected may be ambiguous because the interactions of high energy electrons with the sample can cause spurious effects and (c) the temperature of the sample under observation cannot be measured accurately. These limitations are generally overcome by using other, ensemble measurement techniques such as x-ray or neutron diffraction, x-ray photoelectron spectroscopy, infrared spectroscopy, Raman spectroscopy etc. However, it is almost impossible to create identical experimental conditions in two separate instruments to make measurements that can be directly compared - an undesirable state of affairs. We have designed and built a unique optical spectroscopy platform that is incorporated into the ETEM column and allows us to concurrently measure atomic-scale and micro-scale changes to overcome the limitations outlined above. The current system has been demonstrated for Raman spectroscopy.</p>

Status of Availability

This invention is available for licensing exclusively or non-exclusively in any field of use.

Last Modified: 08/22/2014